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A pilot randomised control trial**

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# Cultivating a Resilient Response to Stress through Mindfulness and Cognitive Re-appraisal: A Pilot Randomised Control Trial

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**Abstract—** The capacity for human service professionals to replenish resilience is important to their health and psychological wellbeing. The current study evaluated a brief Mindful Awareness and Resilience Skills Training (MARST) program designed to enhance mindfulness and positive re-appraisal as psychological mechanisms for increasing resilience, decreasing psychological distress and perceived stress. This program was informed by the Mindful-Cognitive Model of Cultivating Resilience. A sample of 46 human service professionals were randomly allocated to a MARST group or control group. Short term and follow-up training effects were examined using MANOVA. At post-training, the MARST group reported significantly higher levels of resilience, mindfulness and positive re-appraisal compared to the control group. At one-month follow-up, the MARST group reported significantly higher levels of resilience, mindfulness, and positive re-appraisal, and significantly lower levels of perceived stress and psychological distress relative to the control group. The findings provide preliminary support for the efficacy of the MARST program to increase resilience and decrease levels of psychological distress and perceived stress among human services professionals. (Abstract)

**Keywords-** *resilience; mindfulness; psychological distress; positive re-appraisal; perceived stress.*

## I. INTRODUCTION

The literature is replete with evidence that the stress inherent in the helping professions negatively impacts professionals, leading to increased psychological distress (including depression and anxiety) and decreased job satisfaction and productivity (1,2). Because individuals possess a unique set of resources, including ways of perceiving events, meaning making and understanding the world; what seems like a threat to one person may be perceived as a challenge to another (3). As such, research has examined factors associated with an adaptive stress response (4).

Contemporary theories postulate that resilience is not only the absence of psychopathology, but an adaptive response to stress which can be fostered by strengthening protective factors contributing to resilience (5). This postulation has led to

research focusing on identifying the psychological and neurobiological mechanisms associated with enhancing a resilient response to stress.

Cognitive appraisal processes are important for understanding human responses to stressful situations, and suggest that perception determines the degree to which an individual's stress-response is activated (6,7). An individual's perception and construction of events influence their emotional and behavioural reactions to it, determining the coping processes utilised (8). *Perceived stress* describes the degree to which an individual perceives their life as stressful (9). Conversely, *positive re-appraisal* refers to an adaptive process through which stressful events are re-constructed as benign, beneficial, and/or meaningful. The capacity for positive re-appraisal has also been associated with reduced stress and increased mental health outcomes (10). Unlike denial or suppression, which can exacerbate future experience of stress (11), positive reappraisal is an active, meaning-based coping strategy that is often the first step towards a productive reengagement with the stressful event.

Another mechanism thought to enhance adaptive coping is the practice of mindfulness (12,13). Mindfulness is defined as a state of awareness comprised of two interrelated components: the self-regulation of attention to one's immediate experience; and the maintenance of a specific orientation towards that experience. Self-regulation of attention to an immediate experience involves sustained attention, attention switching, and the inhibition of elaborative processing (14). The maintenance of a specific orientation incorporates curiosity, experiential openness, and acceptance, regardless of the emotion, thought or sensation present (14). As a result, the practice of mindfulness allows for an accepting and non-judgemental view of one's internal (e.g., thoughts, feelings and physiological symptoms) and external (e.g., sounds and sights) present moment experience (15). Such skills have the capacity to assist individuals to respond to adversity with increased awareness and intentionality, reducing stress and psychological distress (16).

Whilst early research indicates an association between mindfulness and adaptive cognitive coping, a paucity of research has examined how these factors influence resilience (17). Likewise, limited research has investigated the mechanisms by which mindfulness based interventions enhance resilience, well-being and positive outcomes (18). The current study aims to address these gaps in the literature by evaluating the efficacy of a brief MARST program designed to cultivate resilience by increasing mindfulness and positive re-appraisal skills in human service professionals. This program is informed by The Mindful-Cognitive Model of Cultivating Resilience which extends Garland, Gaylord & Park's Mindful Coping Model (16).

The Mindful-Cognitive Model of Cultivating Resilience shown in Figure 1 theorises that when an adverse event occurs, an initial stress-appraisal is made. In order to foster the capacity to positively re-appraise this event or stressor, a state of mindful awareness is required to enable the individual to decentre. Mindfulness creates inner space and broadens the capacity for awareness and acceptance of thoughts and emotions, without reactivity (19). This allows for the positive re-appraisal of the event, and the attribution of new meaning. This mindful awareness and adaptive cognitive appraisal skills, namely positive re-appraisal, underpin resilience leading to reduced psychological distress and perceived stress.

Figure 1 represents a cross-sectional view of the model and suggests that the process of cultivating resilience occurs in a longitudinal, upward spiral process whereby mindfulness, positive re-appraisal and resilience are mutually enhanced, and psychological distress and perceived stress are reduced over time via the application of mindfulness and positive re-appraisal skills.

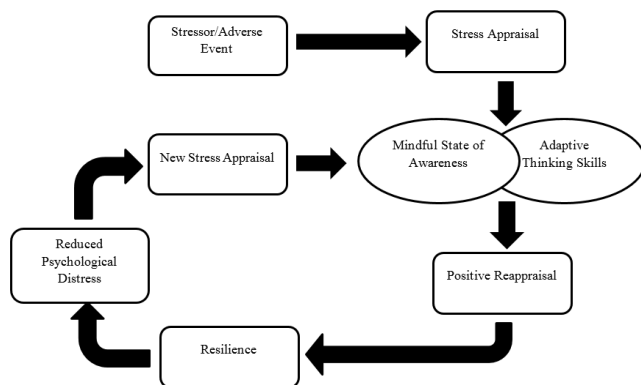


Figure 1. The Mindful-Cognitive Model of Cultivating Resilience

It was predicted that at post-training the MARST group will report significantly higher levels of resilience, mindfulness and positive re-appraisal, and significantly lower levels of perceived stress and psychological distress compared to the control group and these outcomes would be maintained at one month post-training. It was also predicted that mindfulness would facilitate positive re-appraisal, and in turn cultivates resilience. That is, increased mindfulness would be positively associated with positive re-appraisal and resilience.

## II. METHOD

### A. Participants

Forty-six human services professionals from a not-for-profit organisation voluntarily participated in this study and were randomly allocated to the MARST and control groups. Due to attrition, 23 MARST and 18 control group participants completed measurements at one month follow-up training. Participants were aged between 24 to 64 years ( $M = 42$ ,  $SD = 10.58$ ). The sample consisted of 37 females (80.4%) and 9 males (19.6%), and the majority of participants indicated they had not previously attended training in mindfulness meditation ( $n = 26$ ; 56.5%), and over half the sample indicated that they did not practice mindful meditation practice ( $n = 25$ ; 54.3%).

### B. Intervention

The MARST program was offered as a 3 x 1 day training, running over three consecutive weeks. The program incorporated training in formal and informal mindfulness practice, compassion meditation, and cognitive therapy strategies to increase mindful awareness, cognitive re-appraisal and resilience skills.

### C. Measures

*Feasibility and acceptability.* Participant attendance records were kept for each session by the interventionists, and reasons for non-attendance were recorded. The post intervention questionnaire included items to obtain participant feedback on the program and materials.

The battery of questionnaires completed by the participants assessed levels of resilience, mindfulness, positive reappraisal and psychological distress pre and post-training and 1 month follow-up included: The General Wellbeing Schedule (GWB; 20) assessed psychological distress. The Five Facet Mindfulness Questionnaire (FFMQ; 15) a 39-item self-report instrument assessed the general tendency to be mindful in everyday life. The Resilience Questionnaire (RQ; 21) measured levels of resilience across seven domains: emotion regulation, impulse control, causal analysis, self-efficacy, optimism, empathy and reaching out. An overall resilience quotient (RQ) is provided as an average across these seven factors. Higher scores on each of the scales indicate a higher endorsement of that factor of resilience as well as a higher RQ indicated a higher level of overall resilience. The Cognitive Emotion Regulation Questionnaire (CERQ; 22) positive-reappraisal subscale measured positive re-appraisal. The Perceived Stress Scale (PSS; 23) assessed levels of perceived stress, with higher scores indicating higher levels of perceived stress.

## III. RESULTS

Multivariate Analysis of Variance and bivariate correlations were used to test the hypotheses. All analyses were conducted using SPSS (Version 20).

### A. Short Term Treatment Effects: Multivariate Analysis of Variance

A Two-Way Repeated Measures MANOVA was used to test whether there was a significant effect of the MARST

program at post measurement between groups for the dependent variables; Perceived Stress, Mindfulness, Positive Re-appraisal, Resilience, and Psychological Distress. Using Pillai's Trace, the results showed a significant multivariate main effect of Group  $F(10, 31) = 2.45, p < .05$ . The effect size ( $\eta^2 = .442$ ) showed this effect explained 44.2% of the variance in scores. Power to detect the effect was .862. Given the significance of the overall test, the univariate main effects were examined. Significant univariate main effects for group were obtained for the following variables; Resilience,  $F(1, 40) = 4.70, p < .05, \eta^2 = .105$ , power = .562; Mindfulness,  $F(1, 40) = 4.16, p < .05, \eta^2 = .093$ , power = .508; and Positive re-appraisal,  $F(1, 40) = 11.66, p < .05, \eta^2 = .226$ , power = .915. Examination of the means (see Table 1) indicated that post intervention, the treatment group exhibited significantly higher resilience, mindfulness and positive re-appraisal than the control group. Statistically significant differences were not observed between the groups post intervention for Perceived Stress,  $F(1, 40) = .149, p = .229$  and Psychological Distress,  $F(1, 40) = .888, p = .352$ . Thus, the results showed that Hypothesis 1 was partially supported. Table 1 displays the means and standard deviations across groups for the dependent variables individually at pre and post.

TABLE 1. MEANS AND STANDARD DEVIATIONS ACROSS THE MARST AND CONTROL GROUPS AT .PRE AND POST.

Mean and Standard Deviations Across MARST Intervention and Control Groups				
Dependent Variable	MARST Intervention		Control	
	Pre (n=23)	Post (n=23)	Pre (n=19)	Post (n=19)
	M (SD)	M (SD)	M (SD)	M (SD)
Perceived Stress	34.87 (7.78)	33.17 (5.30)	32.74 (7.17)	35.74 (8.22)
Resilience	67.28 (8.90)	70.33 (6.91)	65.70 (10.16)	63.67 (12.65)
Mindfulness	137.91 (26.96)	149.57 (20.88)	135.95 (21.16)	135.68 (23.46)
Positive Re-appraisal	16.09 (3.15)	16.83 (2.69)	14.58 (3.72)	13.42 (3.76)
Psychological Distress	34.78 (4.00)	36.17 (3.42)	34.68 (4.10)	34.89 (5.32)

### B. Follow-up Treatment Effects: Multivariate Analysis of Variance

A Two-Way Repeated Measures MANOVA was used to test whether there was a significant effect of the MARST program at one-month follow-up measurement between groups for the dependent variables. Using Pillai's Trace, the results showed a significant multivariate main effect of Group  $F(15, 21) = 3.47, p = .005$ . The effect size ( $\eta^2 = .713$ ) showed this effect explained 71.3% of the variance in scores. Power to detect the effect was .972. Given the significance of the overall test, the univariate main effects were examined. Significant

univariate main effects for group were obtained for all dependent variables at one month follow-up; Resilience,  $F(1, 35) = 11.16, p < .05$ , partial eta square = .242, power = .901; Mindfulness,  $F(1, 35) = 4.68, p < .05, \eta^2 = .118$ , power = .557; Positive re-appraisal,  $F(1, 35) = 5.59, p < .05, \eta^2 = .138$ , power = .633; Perceived Stress,  $F(1, 35) = 7.55, p < .05, \eta^2 = .177$ , power = .762 and Psychological Distress,  $F(1, 35) = 4.53, p < .05, \eta^2 = .115$ , power = .544. Table 2 displays the means and standard deviations across groups for the dependent variables individually at pre, post and one-month follow-up. Examination of the means (See Table 2) indicates that at one-month follow-up, compared to the control group, the MARST group reported significantly higher resilience, mindfulness and positive re-appraisal and significantly lower perceived stress and psychological distress. Thus, the results showed that Hypothesis 2 was supported.

TABLE 2. MEANS AND STANDARD DEVIATIONS ACROSS THE MARST AND CONTROL GROUPS AT .PRE, POST AND ONE MONTH FOLLOW-UP.

Mean and Standard Deviations Across MARST Intervention and Control Groups						
Dependent Variable	MARST (n=21)			Control (n=16)		
	Pre	Post	Follow-Up	Pre	Post	Follow-Up
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
Perceived Stress	34.52 (8.05)	32.95 (5.32)	32.00 (6.98)	32.56 (7.48)	35.56 (8.50)	38.63 (7.63)
Resilience	67.62 (9.19)	70.51 (7.21)	74.39 (7.34)	65.97 (10.30)	64.33 (12.52)	63.93 (11.65)
Mindfulness	138.86 (27.94)	151.14 (21.18)	154.10 (21.85)	135.56 (21.35)	135.62 (22.80)	135.25 (22.38)
Positive Re-appraisal	16.24 (3.25)	17.19 (2.50)	16.33 (3.07)	14.63 (3.69)	13.50 (3.76)	13.69 (3.74)
Psychological Distress	34.81 (4.19)	36.19 (3.59)	36.76 (2.72)	34.25 (4.24)	35.00 (5.78)	34.13 (4.76)

### C. Preliminary Results for Mindfulness and Positive Re-appraisal as Mechanisms for Cultivating Resilience

A number of statistical relationships were found to support hypothesis three; that increased mindfulness would be related to an increase in positive re-appraisal and resilience. Firstly, post and follow-up MANOVAs showed MARST group positive re-appraisal and resilience scores significantly increased, as did overall mindfulness scores compared to the control group. Secondly, bivariate correlations showed that for the MARST group post intervention, mindfulness was found to strongly positively correlate with positive re-appraisal ( $r = 0.61, p < .001$ ) and resilience ( $r = 0.73, p < .001$ ). Positive re-appraisal was also found positively correlate with resilience ( $r = 0.53, p < .001$ ). Significant positive correlations were also observed between these variables at one-month follow-up. Mindfulness was found to positively correlate with positive re-appraisal ( $r = 0.56, p < .001$ ) and resilience ( $r = 0.58, p < .001$ ).

Positive re-appraisal was also found positively correlate with resilience ( $r = 0.48$ ,  $p < .001$ ).

#### IV. DISCUSSION

This study evaluated the efficacy and feasibility of a brief Mindful Awareness Resilience Skills Training program (MARST) to increase levels of resilience, mindfulness and positive re-appraisal, and decrease perceived stress and psychological distress among human service professionals. The study addressed commonly cited limitations in the literature, by including a control group, collecting comprehensive quantitative data, and utilizing participant follow-up, allowing for the longer term treatment effects to be examined.

The results partially supported the first prediction that, compared to the control group, the MARST group would report significantly higher levels of resilience, mindfulness and positive re-appraisal, and significantly lower levels of perceived stress and psychological distress post-training. The MARST group, compared to the control group, scored significantly higher on measures of resilience, mindfulness and positive re-appraisal post intervention, but not on measures of perceived stress and psychological distress.

A lack of significance between the two groups on measures of perceived stress and psychological distress suggest that these variables may be complex and require the mastery and application of mindfulness and positive re-appraisal skills in order to facilitate a reduction in these areas over time. This notion supports previous research (e.g., 18) examining stress reductive effects of mindfulness-based intervention, where a reduction in stress and improvement in psychological well-being was observed following the completion of an intervention spanning over eight weeks. Furthermore, the current study used a brief intervention, designed to provide skills to master, tolerate and manage stressful events as well as recover from stressful situations (i.e., the capacity to accept, re-appraise and make new meaning and replenish resilience). Whilst the efficacy of brief interventions are emerging (e.g., 24), this finding may suggest that the application of these skills take time to reduce perceived stress and psychological distress in human service professionals.

Training effects would be maintained at one month follow-up was supported. That is, compared to the control group the MARST group reported significant increases in resilience, mindfulness and positive re-appraisal, and significant decreases in perceived stress and psychological distress at one month follow-up. The MARST program was aimed at a professional population, and thus included complex and integrated mindfulness awareness and resilience skills, suggesting that time was required for human service professionals to apply these skills and reduce levels perceived stress and psychological distress. These results also suggest that the beneficial effects of mindfulness on perceived stress and psychological distress are associated with strengthening a positive cognitive-emotional process (i.e., mindfulness and positive re-appraisal), rather than disrupting a negative one. These results are consistent with the findings of previous research (9), which found significantly higher mindfulness and

positive re-appraisal, and significantly lower perceived stress following an eight week MBSR course.

Whilst previous research has established reductions in maladaptive cognitive factors (e.g., unhelpful thinking styles) as being associated with decreased perceived stress, the current results suggest that reductions in both perceived stress and psychological distress are the result of a positive growth process. This process is focused on increasing awareness, self-attunement and adaptive cognitive coping capacity. Therefore, a resilient response to stress is not just an absence of psychopathology, but underpinned by positive psychological processes which reduce distress over time (9). In this way, mindfulness meditation can be incorporated into cognitive therapy to strengthen or maximize the process of cognitive restructuring. Although mindfulness-based cognitive approaches typically incorporate mindfulness-based stress reduction techniques within a cognitive therapy framework, the Mindful-Cognitive Model of Cultivating Resilience proposes the importance of integrating both of these approaches equally. Through this equal integration internal processes of maladaptive thinking and perceptions and positive reappraisal can be targeted for change using both formal and informal mindfulness practices and cognitive therapy techniques.

The third prediction was supported as the results suggested that increased mindfulness were related to an increase in positive re-appraisal and resilience. Firstly, a number of statistical relationships (including those outlined in prediction one and two) revealed that mindfulness, positive re-appraisal and resilience significantly increased from pre, post and one month follow-up for the MARST group compared to the control group. Secondly, post-training and one month follow-up mindfulness, positive re-appraisal and resilience scores for the MARST group were found to positively correlate. Although preliminary, these findings provide support for the proposed theoretical mechanisms of the Mindful-Cognitive Model of Cultivating Resilience.

These results suggest that increases in mindfulness, are associated with growth in positive re-appraisal and resilience in human service professionals. Specifically, increased capacity to mindfully decenter from cognitive appraisals of stress and observe present moment experience in a non-judgmental way may promote positive re-appraisal coping over time. These findings provide support for an upward spiral process of positive psychological processes, and evidence for the underlying cognitive mechanisms associated with a resilient stress-response.

In terms of limitations of the study, attrition contributed to a small sample size, which limits the generalisability of the findings. That stated, the study showed significant findings with a small sample size, suggesting promise for both the efficacy of the MARST program and the Mindful-Cognitive Model of Cultivating Resilience. Additionally, the study used a non-clinical sample and therefore future research is recommended to use a clinical sample to evaluate the efficacy of MARST program at decreasing perceived stress and psychological distress, and increasing resilience. Given the pilot nature of this study, it is unclear whether participants would have benefited from longer training program. However,

a longer program may have increased the potential for attrition in this population. Future research could also implement a longitudinal research design to examine training effects over time. This would assist to clarify the relationship between variables and length of MARST program, as well as frequency and duration of mindful meditation practice.

Whilst preliminary support has been provided for the Mindful-Cognitive Model of Cultivating Resilience, future research could use regression analyses to test whether mindfulness and positive re-appraisal promote each other, and resilience. This would provide information on the relationship between mindfulness and positive re-appraisal, and assist to clarify the casual underpinnings of a resilient response to stress. Path analysis may also be used to examine the directional links between the variables and explore whether changes in mindfulness, resilience and perceived stress are mediated by positive re-appraisal. Furthermore, mindfulness may facilitate resilience through other pathways in addition to positive re-appraisal or other executive control functions which may contribute to fostering positive re-appraisal. These aspects could be examined in future research, to build on the model and explore other mechanisms via which resilience can be cultivated.

The significant findings from this current study show promise for the MARST program as a resilience building strategy for human service professionals, and the Mindful-Cognitive Model of Cultivating Resilience offers preliminary insight into specific internal mechanisms of how these may serve as an antidote to cognitive stress states and cultivate resilience.

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#### AUTHORS' PROFILE

Dr Aileen Pidgeon was awarded PhD in Clinical Psychology from University of Qld. Currently she works as an Assistant Professor Psychology at Bond University, Gold Coast, Australia. Dr Pidgeon conducts research in the area of resilience, mindfulness, mental health and parenting. Dr Pidgeon has authored and published numerous peer-reviewed articles researching the role of mindfulness and resilience in enhancing mental health. She is author of a Mindful Awareness Resilience Skills Training program, and has led training, workshops and retreats on mindfulness and resilience skills training to promote the psychological health and wellbeing in the community.

Ms Breeana o'Brien is a PhD scholar and psychologist, having graduated from a Masters of Psychology (Clinical) at Bond University in 2014. She is currently completing a PhD in the area of mindfulness and resilience, with a focus on the role of mindfulness in enhancing both psychological and physiological well-being. Breeana also works as a psychologist predominantly with children, adolescents and families in a private practice setting.

Mr Andrew Hanna is a provisional psychologist currently completing a Master of Psychology (Clinical) at Bond University on the Gold Coast. He completed undergraduate studies and a Post Graduate Diploma in Psychology at Monash University. Andrew has experience working with children, adolescents and adults and has completed placements with older persons and individuals with persistent pain. Andrew has a particular interest in the application of mindfulness based interventions with clients with chronic health conditions.

Ms Frances Klaassen has worked for 33 years with families at risk of breakdown and with children for whom foster care has become a necessary intervention and guided the establishment of the first specialist foster care service in Queensland for children with complex needs and severe trauma arising from sexual abuse. Frances is a key contributor to state and regional collaborative forums and interagency committees and has been a member of the Australian Association of Social Workers since 1980.